CENTRAL COAST LONG-TERM ENVIRONMENTAL ASSESSMENT NETWORK

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January 21, 2019

Mr. Christopher Rose
Central Coast Regional Water Quality Control Board
895 Aerovista Place, Suite 101
San Luis Obispo, CA 93401-7906

RE: Comments on Ag Order 4.0 Conceptual Regulatory Requirement Options

Dear Mr. Rose:

Thank you for the opportunity to provide comments on the referenced Ag Order 4.0 Conceptual Requirement Options (Ag Order). The Central Coast Long-term Environmental Assessment Network (CCLEAN) has been performing cutting-edge monitoring in ocean waters of Monterey Bay, wastewater discharges, and regional rivers since 2002. It is the only monitoring program in the area with a focus on chemical contaminants in ocean waters. CCLEAN is supported by the City of Santa Cruz, City of Watsonville, Monterey One Water, Carmel Area Wastewater District, and Moss Landing Power Plant as an example of their environmental stewardship and in partial satisfaction of their NPDES receiving water monitoring requirements. Consistent participation and encouragement have been received from the Central Coast Water Board.

I am writing to urge inclusion of legacy agricultural pesticides in the Ag Order as they are contaminants that continue to be discharged from agricultural watersheds into the ocean with deleterious effects on beneficial uses. These legacy pollutants are typically organochlorine compounds that can be acutely toxic. In addition to being toxic, they break down very slowly in the environmental and are lipid soluble, which enhances bioaccumulation and biomagnification in predators higher in the food chain. During the process of designing the CCLEAN program, scientific publications were reviewed that reported fishes from deep Monterey Bay have high concentrations of legacy pollutants, such as DDTs, dieldrin, and PCBs, relative to other similar environments world-wide. Moreover, articles written by USGS scientists have identified Monterey Bay as a source of DDTs to central California marine sediments.

During the first five years of CCLEAN, our results demonstrated that substantial loads of DDTs and dieldrin are discharged into the ocean from the Pajaro and Salinas rivers. Summed annual loads of DDTs from these two rivers averaged 7 kilograms per year, which constituted over 99% of the DDT loads into Monterey Bay from sources measured by CCLEAN (Figure 1). Summed dieldrin loads averaged nearly 400 grams per year (Figure 2). More recently, heavy rainfall in 2017 was associated with the highest loads of DDTs and dieldrin measured by CCLEAN from the Pajaro River into the ocean, 26 and 1.4 kilograms/year, respectively (Figure 3). These loads resulted in the highest concentrations ever measured for DDTs and dieldrin by CCLEAN in northern Monterey Bay ocean waters (Figure 4). They also substantially exceeded their respective California Ocean Plan objectives and were associated with the highest concentrations measured by CCLEAN in mussels along the northern shore of Monterey Bay, also in 2017. The mussel concentrations exceeded USEPA human health alert levels for subsistence fishers.

The effects of DDT loads from agricultural watersheds are not necessarily restricted to aquatic habitats. Recent hatching failures in California Condors residing in central California coastal mountains were described in a paper by Burnett, et al (2013). The shell thinning observed in these hatching failures was consistent with DDT effects. The authors suggested the condors ingested DDTs through consumption of beach-cast sea lion carcasses.

CCLEAN studies of DDTs in the Pajaro River have revealed several lines of evidence regarding their sources. First, concentrations of DDTs in the river are correlated with rainfall and not with river flow, which suggests that high DDTs are primarily washed off the land during storms, rather than being mobilized from historic deposition in river sediments. Second, the relative composition of the six DDT compounds revealed that high concentrations of DDTs in the river are more likely coming from sources that are not deeply buried in the sediment. Moreover, the presence of substantially undegraded DDT in the Pajaro River suggests that either the half-life of DDTs in the Pajaro watershed (and probably the Salinas watershed, also) is much longer than reported in the scientific literature for other locations or that use of DDT continued in the Pajaro River watershed after it was banned from agricultural uses in 1972. Finally, comparisons of CCLEAN data from the Pajaro River and DDT analyses performed on farm soils from the Pajaro watershed in 1985 by the Department of Food and Agriculture (now the Department of Pesticide Regulation) showed a very close correspondence in the composition of average wet-season DDTs in the river between 2002 and 2017 with agricultural sediments from San Benito County in 1985 (Figure 5), suggesting river DDTs have a composition nearly identical to those remaining in agricultural soils in the Pajaro River watershed as recently as 1985.

Not only are the legacy pesticides being discharged from agricultural watersheds impairing beneficial uses in Monterey Bay, but the rivers, themselves, are impaired. Both the Pajaro and Salinas rivers are on the 303(d) list due to frequent exceedances of water quality criteria for legacy pesticides developed by USEPA and the California Toxics Rule for the protection of aquatic life and municipal uses (figures 6 and 7).

When it became clear during the first five years of CCLEAN that rivers are the dominant sources of legacy contaminants discharged into Monterey Bay, some program participants declined to support continued monitoring of the rivers, as these are sources over which they have no control. For many years, CCLEAN monitoring continued on the Pajaro River and the San Lorenzo River through direct funding from the City of Watsonville and the City of Santa Cruz, respectively. With the increased financial burden of complying with stormwater regulations, the City of Watsonville was recently forced to withdraw support for river monitoring, which now leaves the San Lorenzo River as the only river currently monitored by CCLEAN, and that only with direct funding from the City of Santa Cruz. As the ocean impairments associated with discharges of legacy contaminants from agricultural watersheds have become clearer, the importance of maintaining consistent monitoring efforts aimed at determining the magnitude and sources of their continuing loads into the ocean is apparent. The Ag Order is an appropriate vehicle for restoring monitoring of legacy pollutants in the Pajaro and Salinas rivers that are impairing river and ocean beneficial uses.

Based upon these findings, we provide the following comments:

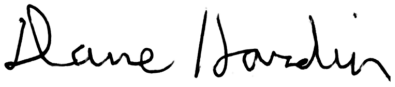
1. Existing water quality criteria for legacy pesticides should be enforced. This would require inclusion of specific Ag Order program objectives and monitoring requirements aimed at determining major sources and reducing concentrations of legacy pesticides in the Pajaro and Salinas rivers for which they are listed as impaired on the 303(d) list. These monitoring requirements should include analytical reporting limits below environmentally relevant criteria, as well as delivery of publicly available data to allow cross-cutting analyses of regional status and trends of legacy contaminants.

2. Implementation of the Ag Order should include an objective of reducing loads of legacy pesticides from the Pajaro and Salinas rivers into Monterey Bay. Achievement of this objective should be documented by restoration of legacy pesticide load measurements in the Pajaro and Salinas rivers by CCLEAN.

3. Future iterations of the Ag Order should be informed by broad stakeholder participation, including a request for relevant data from regional monitoring entities. Stakeholders should share their relevant data and opinions in an open forum so that all sides can hear and respond to supporting data. Such a process would allow the Water Board to be the arbiter of ideas honed by public discourse.

Thank you for your consideration.

Sincerely



Dane Hardin
Director

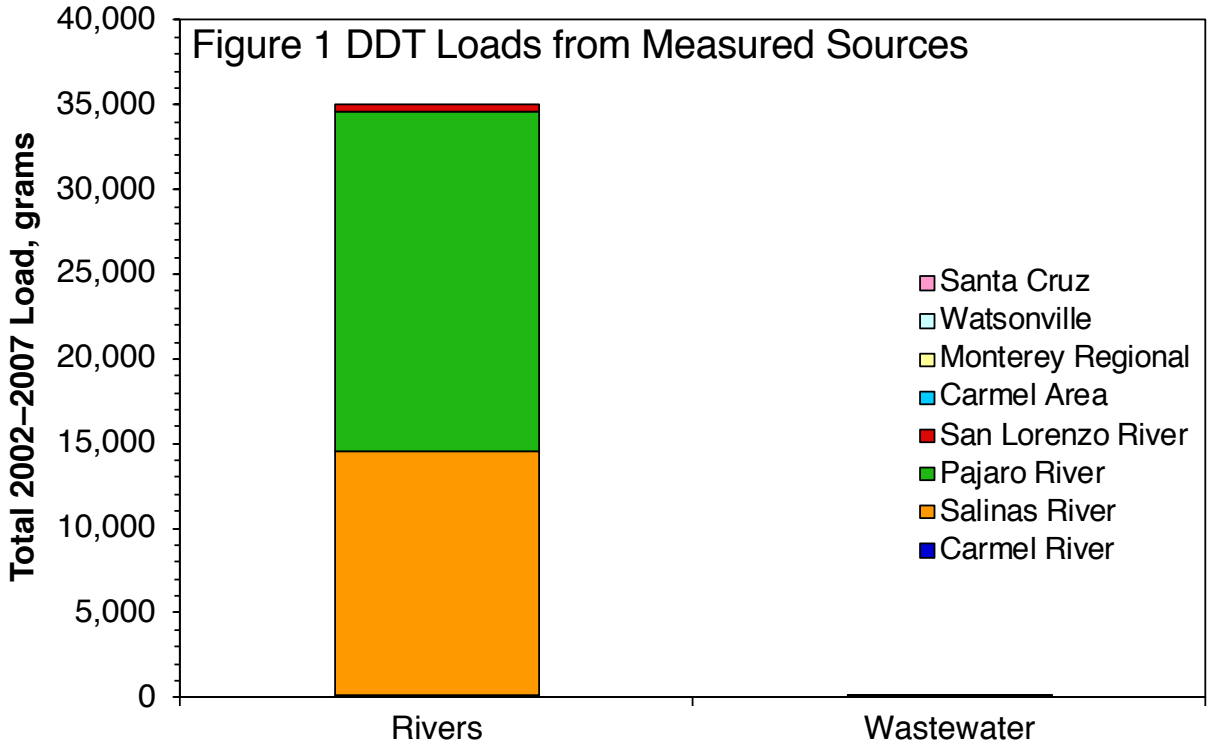


Figure 1 DDT Loads from Measured Sources
Total 2002–2007 Load, grams
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
Rivers
Wastewater
Santa Cruz
Watsonville
Monterey Regional
Carmel Area
San Lorenzo River
Pajaro River
Salinas River
Carmel River

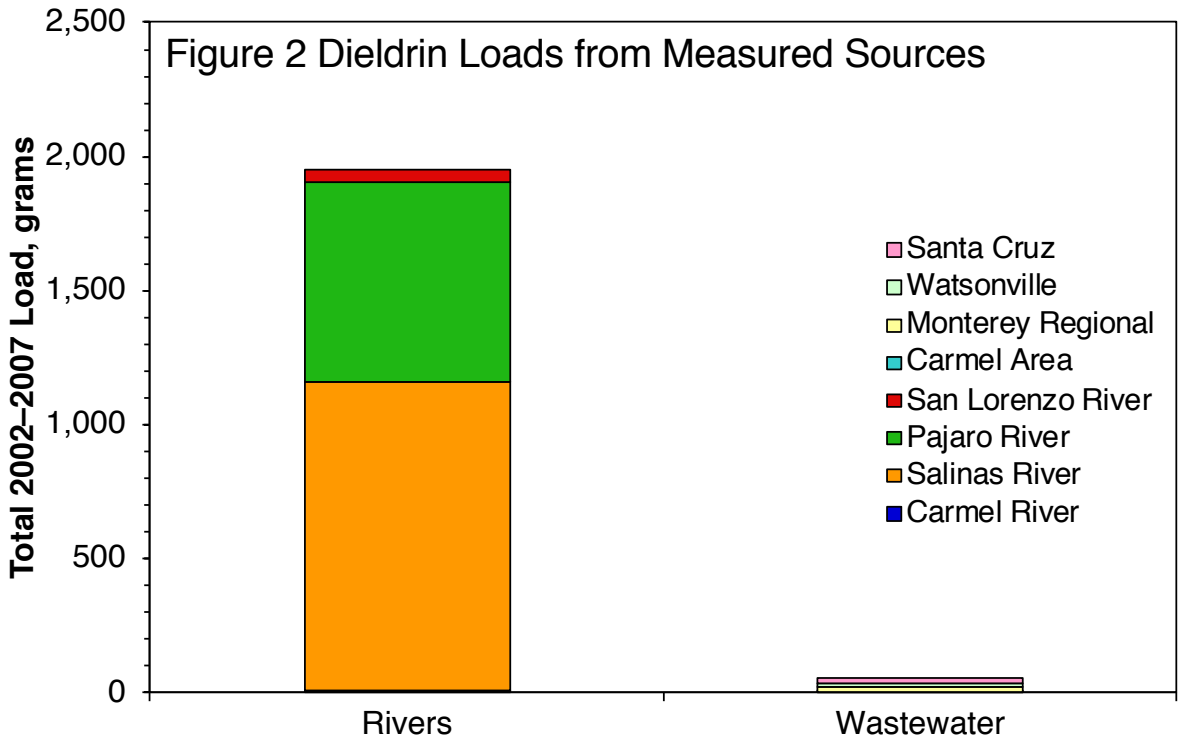


Figure 2 Dieldrin Loads from Measured Sources
Total 2002–2007 Load, grams
2,500
2,000
1,500
1,000
500
0
Rivers
Wastewater
Santa Cruz
Watsonville
Monterey Regional
Carmel Area
San Lorenzo River
Pajaro River
Salinas River
Carmel River

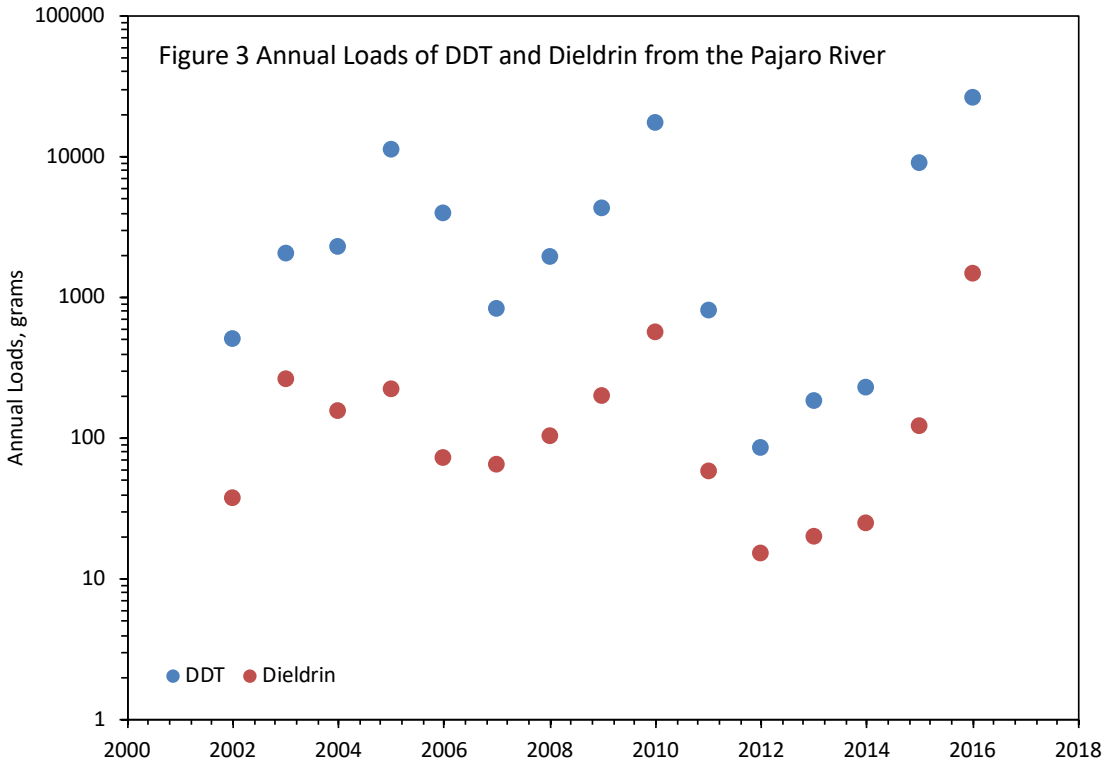


Figure 3 Annual Loads of DDT and Dieldrin from the Pajaro River
Annual Loads, grams
100000
10000
1000
100
10
1
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
DDT
Dieldrin

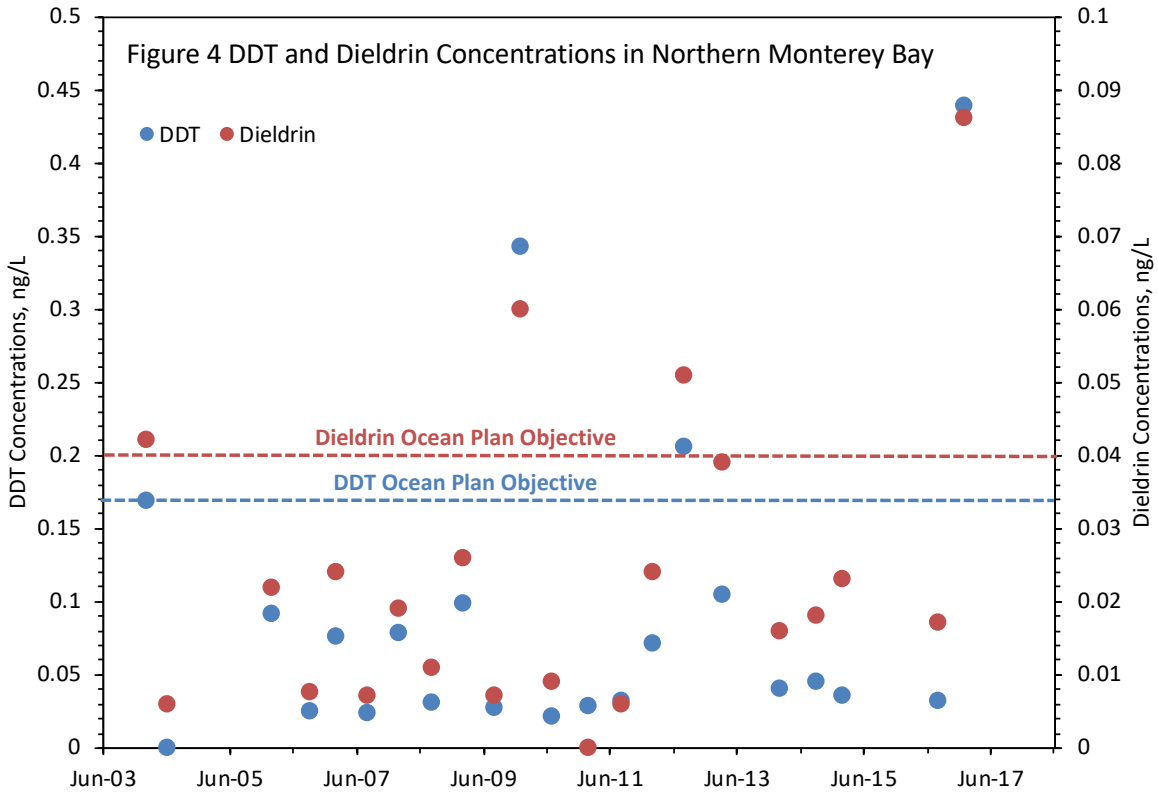


Figure 4 DDT and Dieldrin Concentrations in Northern Monterey Bay
DDT Concentrations, ng/L
Dieldrin Concentrations, ng/L
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
Jun-03
Jun-05
Jun-07
Jun-09
Jun-11
Jun-13
Jun-15
Jun-17
DDT
Dieldrin
Dieldrin Ocean Plan Objective
DDT Ocean Plan Objective

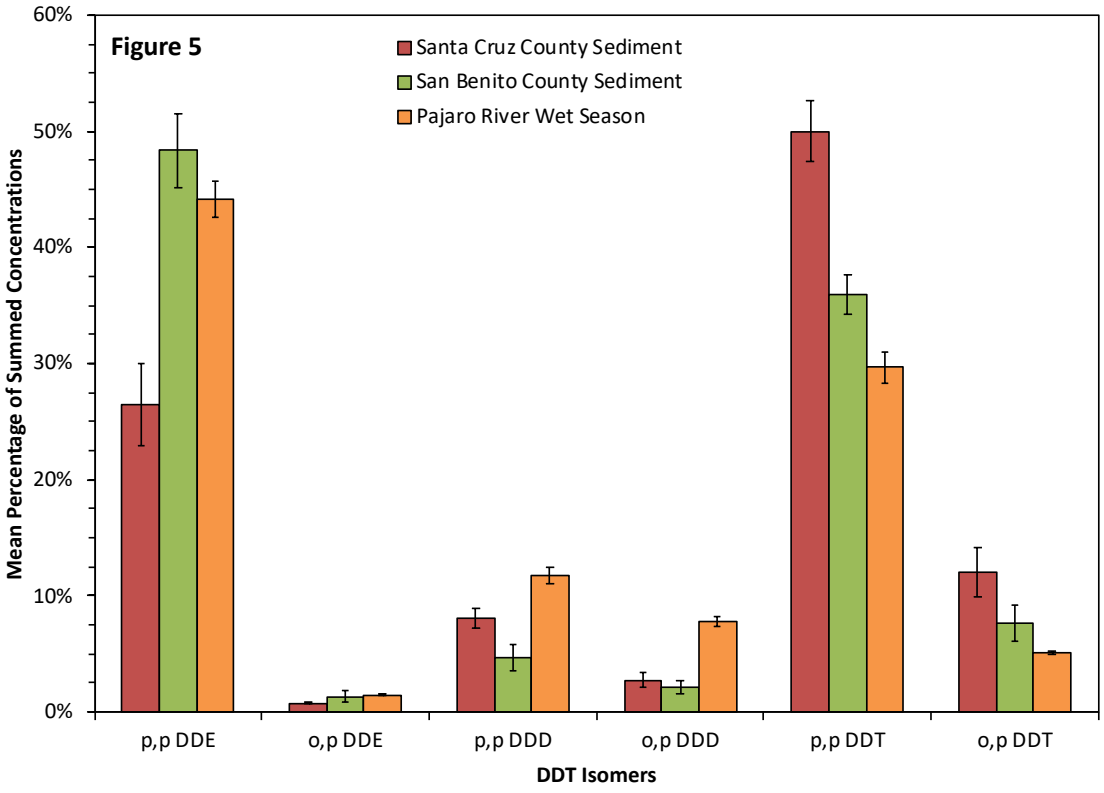


Figure 5
Santa Cruz County Sediment
San Benito County Sediment
Pajaro River Wet Season
Mean Percentage of Summed Concentrations
60%
50%
40%
30%
20%
10%
0%
p,p DDE
o,p DDE
p,p DDD
o,p DDD
p,p DDT
o,p DDT
DDT Isomers

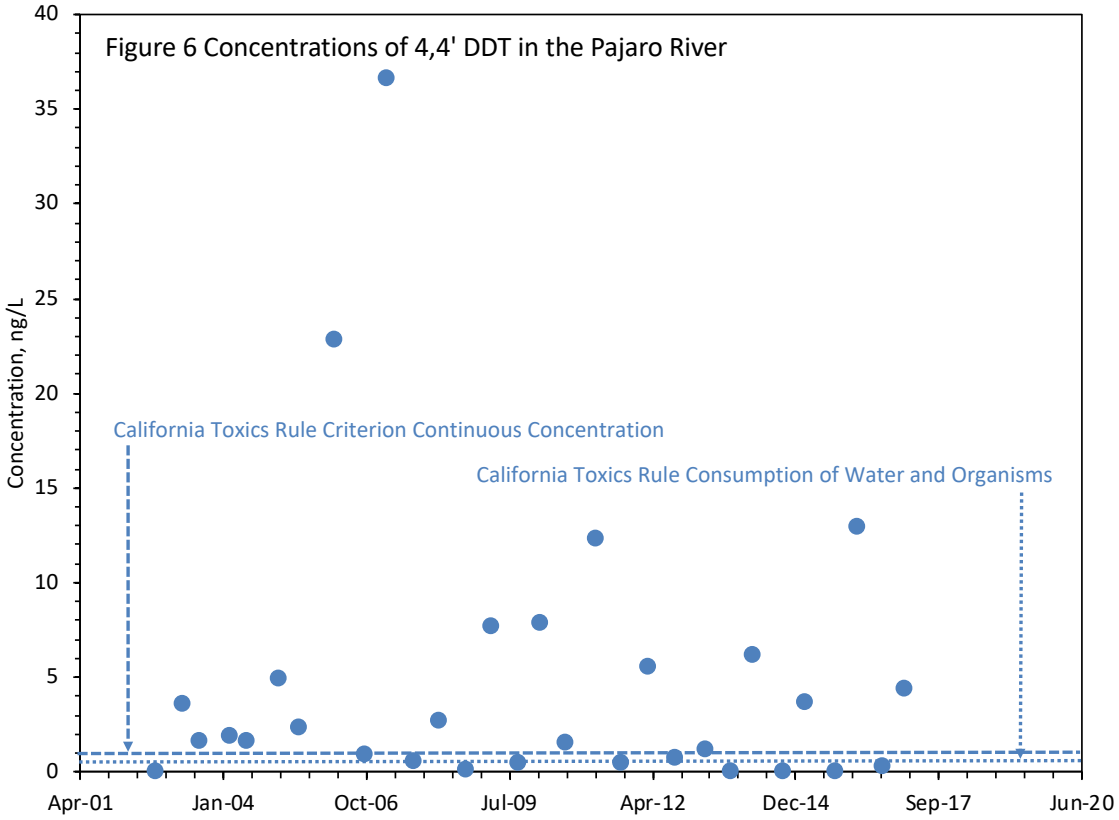


Figure 6 Concentrations of 4,4' DDT in the Pajaro River
Concentration, ng/L
40
35
30
25
20
15
10
5
0
California Toxics Rule Criterion Continuous Concentration
California Toxics Rule Consumption of Water and Organisms
Apr-01
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
Jun-20

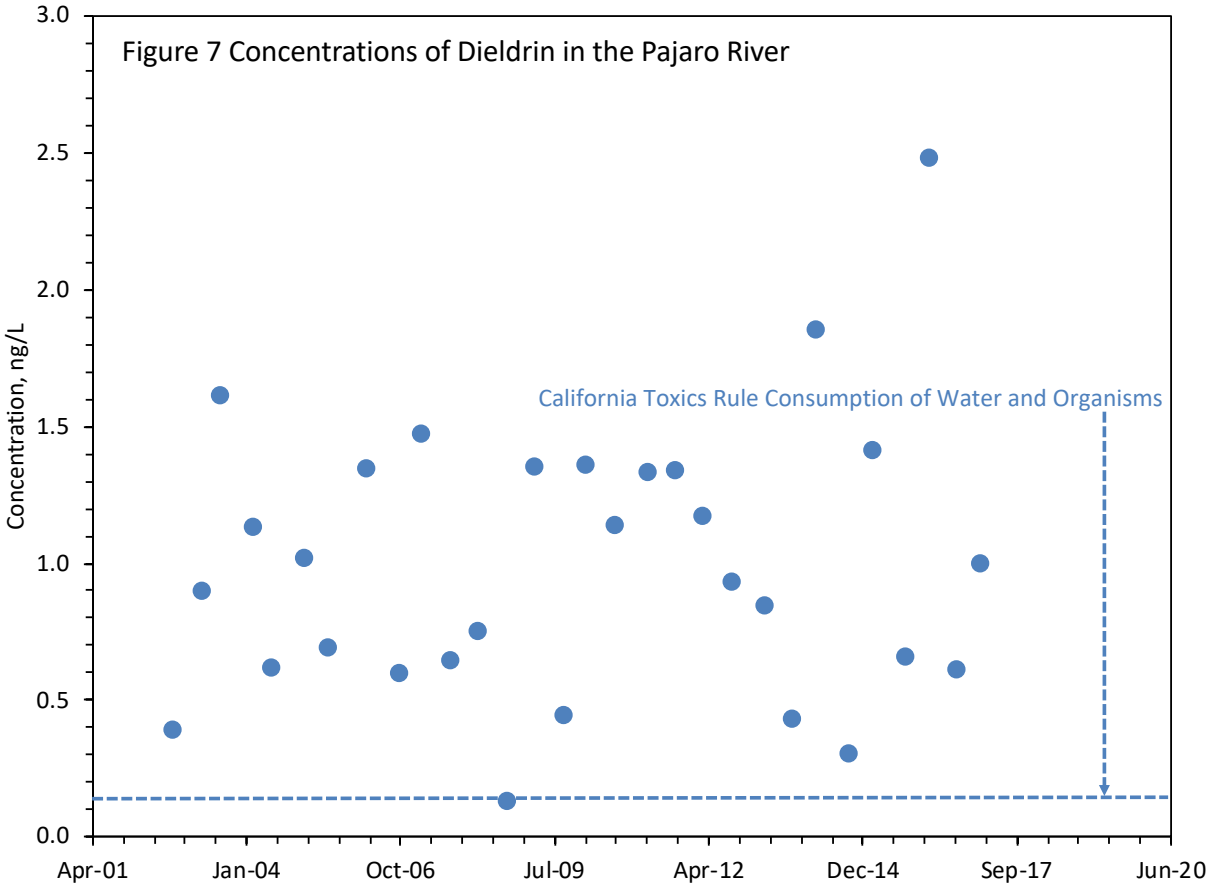


Figure 7 Concentrations of Dieldrin in the Pajaro River
Concentration, ng/L
3.0
2.5
2.0
1.5
1.0
0.5
0.0
California Toxics Rule Consumption of Water and Organisms
Apr-01
Jan-04
Oct-06
Jul-09
Apr-12
Dec-14
Sep-17
Jun-20